

# Virginia Wastewater Surveillance Program: Community of Practice

**WWS Team**

**VDH | Office of Environmental Health Services**

**August 25, 2021**



# Agenda

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1. Updates & Funding Opportunities (5 mins)

2. Topic(s) of Interest (15 mins):

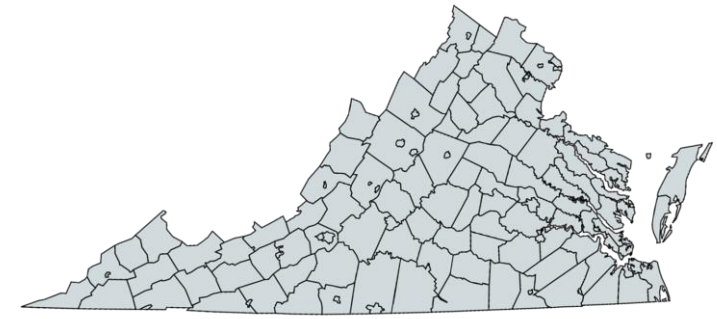
*Data Visuals and Dashboards*

1. Open Discussion (5-10 mins)



# General Updates

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## ❖ DCIPHER (weekly):

- Uploading of HRSD WWS data
- Gathering & cleaning other sites' historical WWS data
- Uploading patient case data (in progress)

## ❖ Local Projects (on-going):

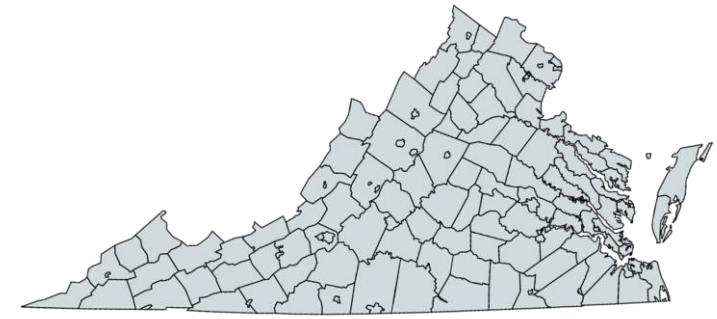
- Chesapeake
- Roanoke

## ❖ Round 2 Funding (starting soon!):

- **Sentinel Monitoring**
- Variant Testing
- Local Projects

# Updates: Sentinel Monitoring

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## SARS-CoV-2 monitoring at influent to 25 wastewater treatment plants statewide

- ❖ Reviewed applications
- ❖ Selected 25 representative sampling sites for a good geographic coverage throughout the state
- ❖ Tentative sampling start date: mid-September
- ❖ Kick-Off Meeting: August 30<sup>th</sup> & 31<sup>st</sup>
  - Share details with the selected sites



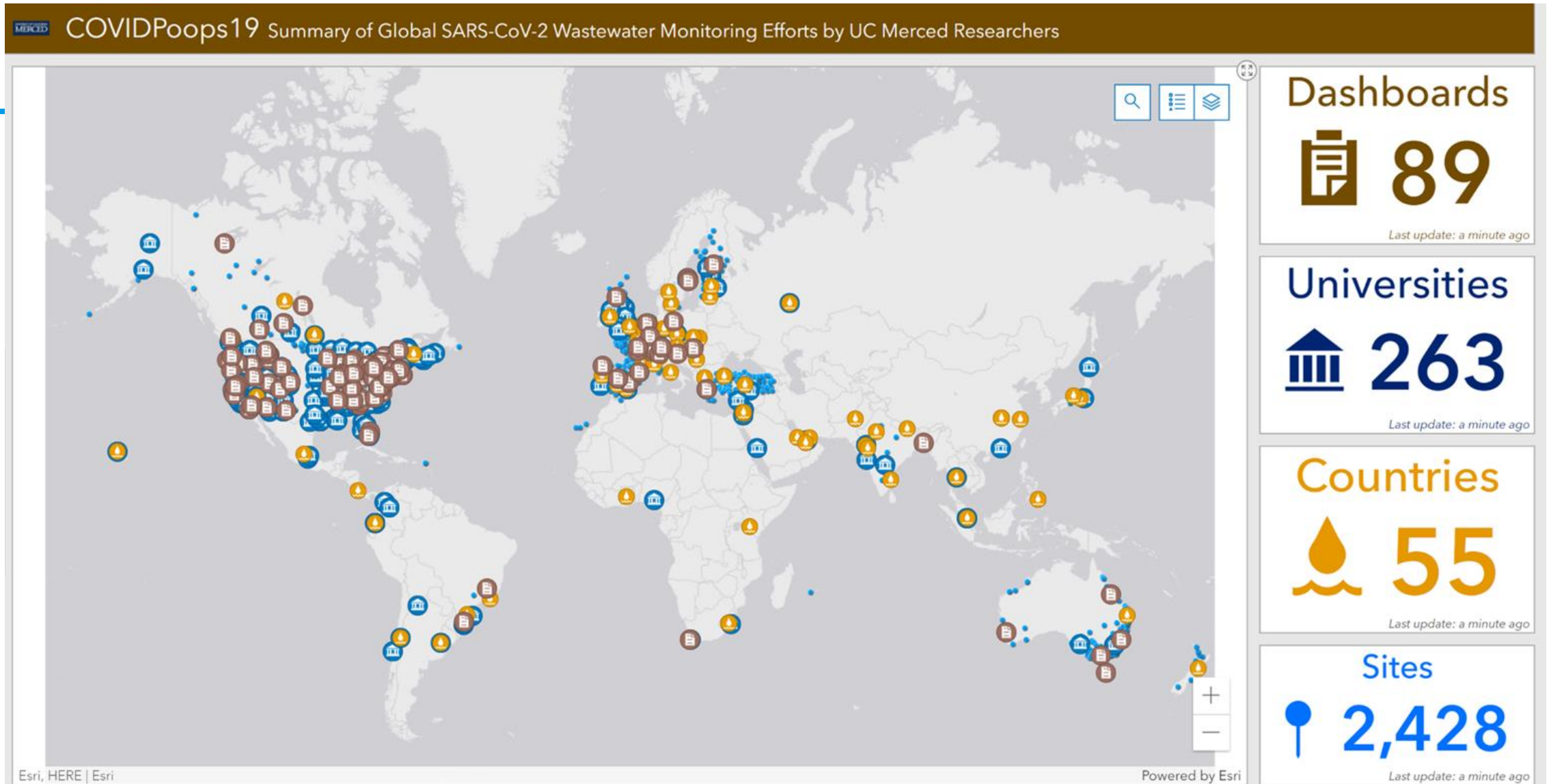
August's Topic of Interest



Data Visuals & Dashboards



# Current Dashboards (and where to find them)



# Common Visualizations: Viral Conc./Load

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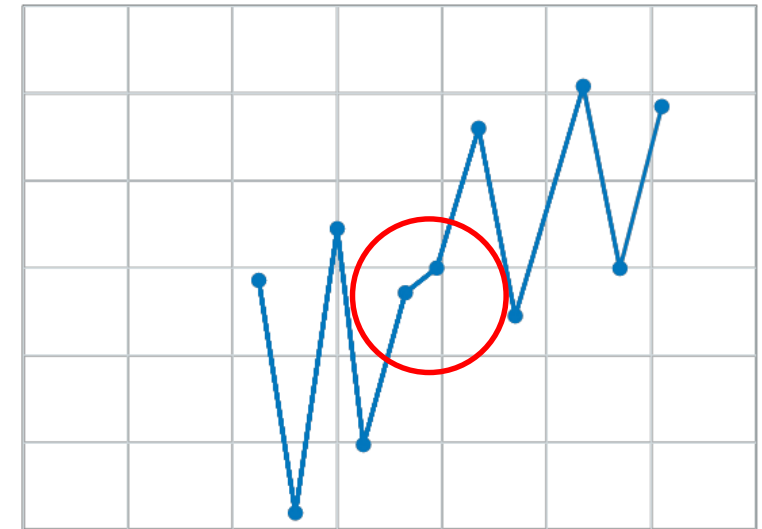
**Viral Concentration**

[copies/volume]

**x FLOW**



[volume/day]



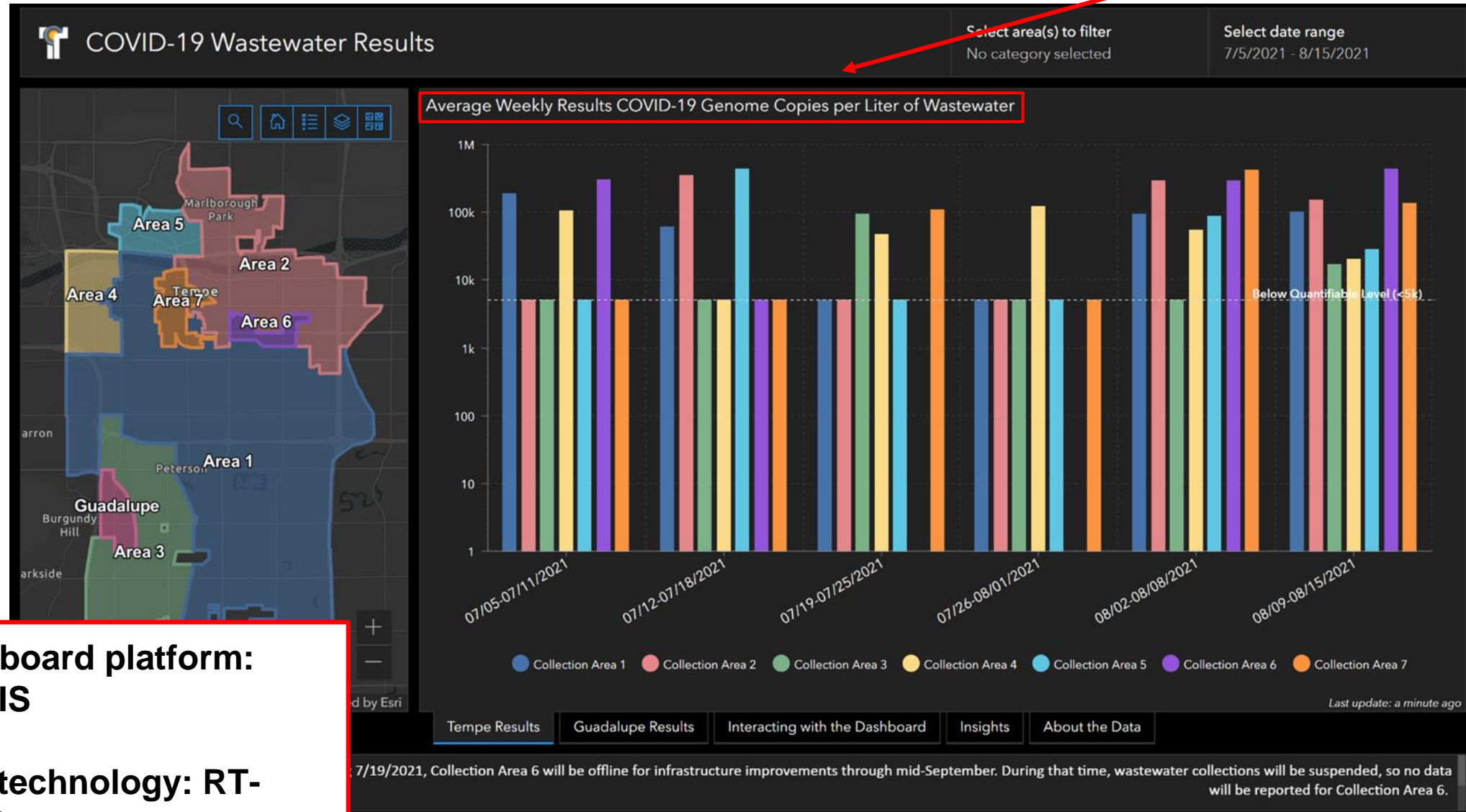
**Viral Load**

[copies/day]



# Dashboards: Tempe, AZ

Concentration [copies/L wastewater]



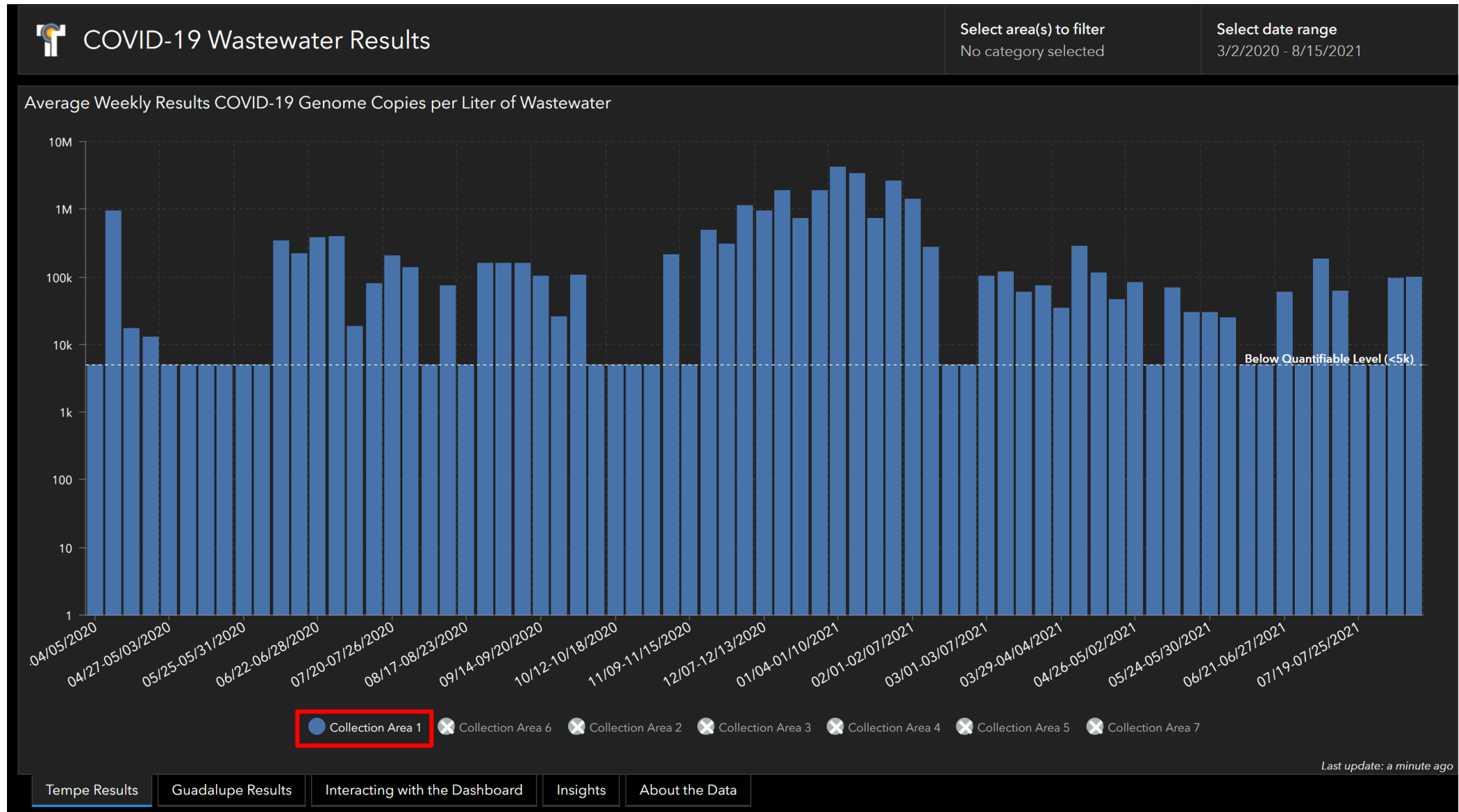
Dashboard platform:  
ArcGIS

PCR technology: RT-  
qPCR

Source: [Tempe COVID-19 Wastewater Dashboard](#)



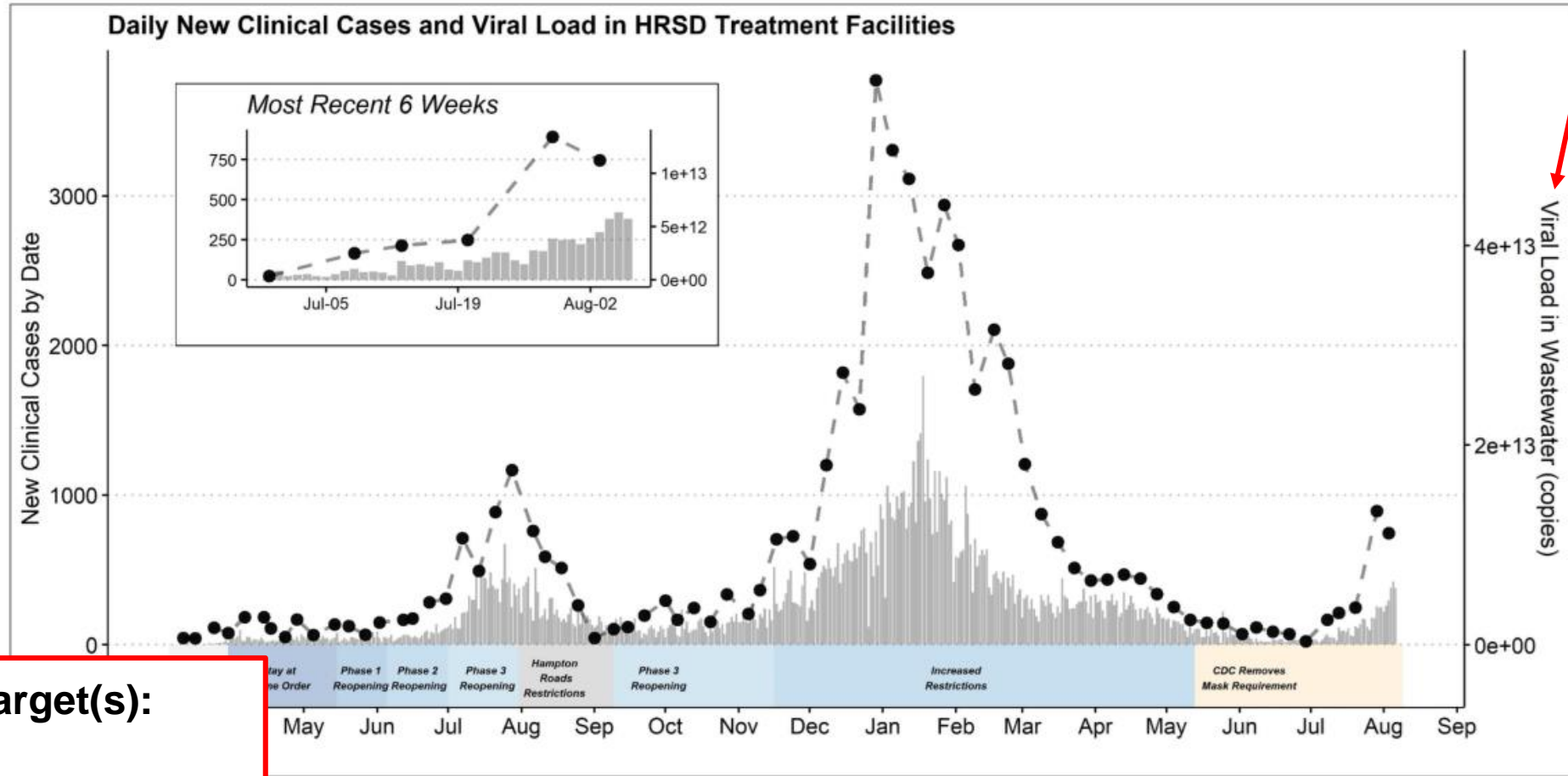
# Dashboards: Tempe, AZ



Source: [Tempe COVID-19 Wastewater Dashboard](#)

# Dashboards: HRSD, VA

Load [million gene copies/day]



**Gene Target(s):**  
N gene

**PCR technology:**  
ddPCR

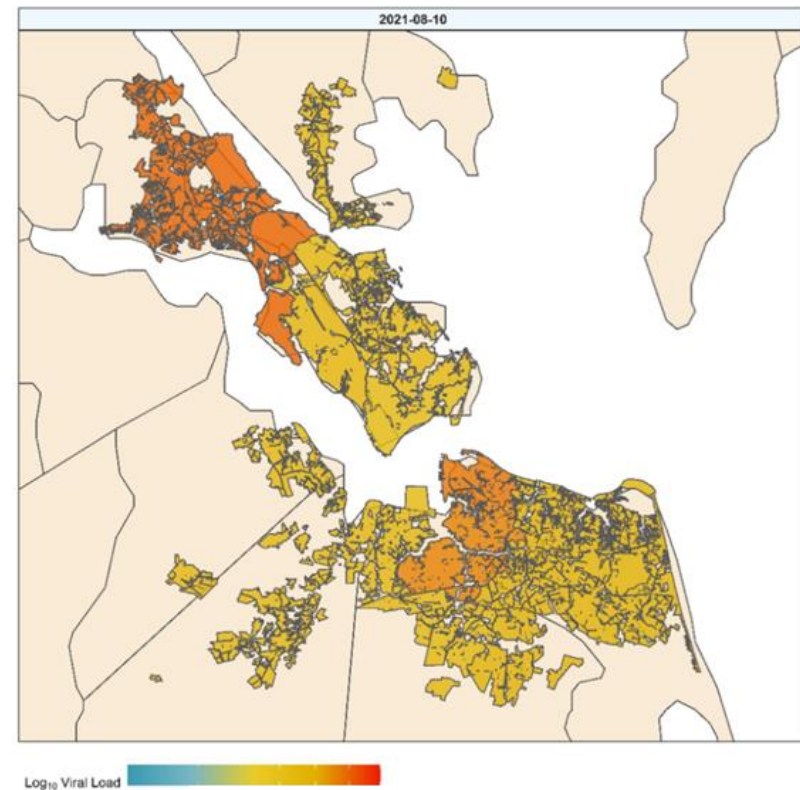
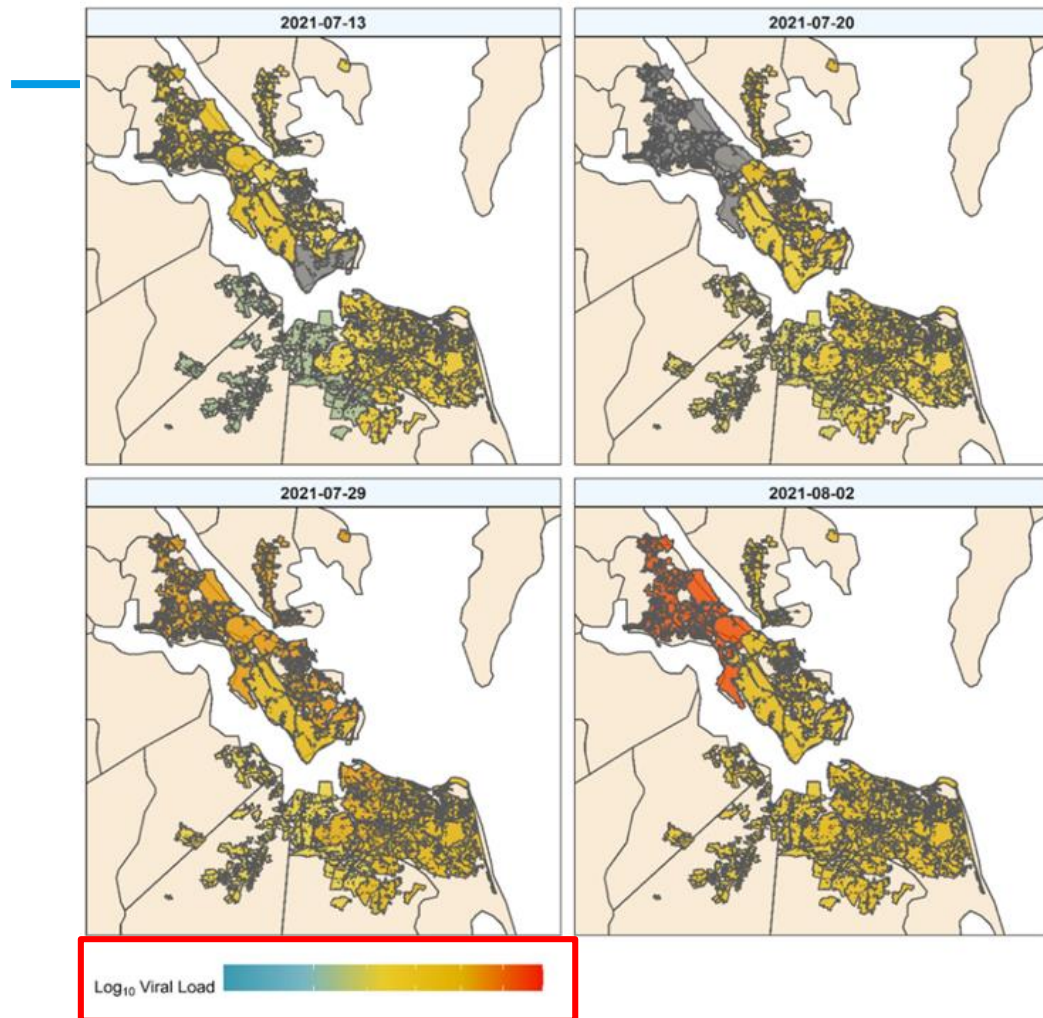
SARS-CoV-2 RNA copies in wastewater

6

**HRSD**

Source: [HRSD COVID-19 Surveillance](#)

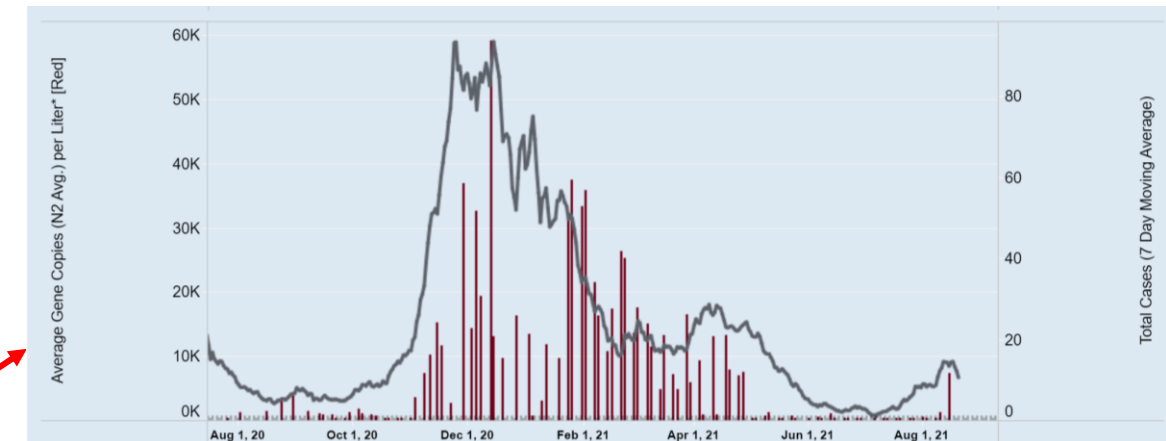
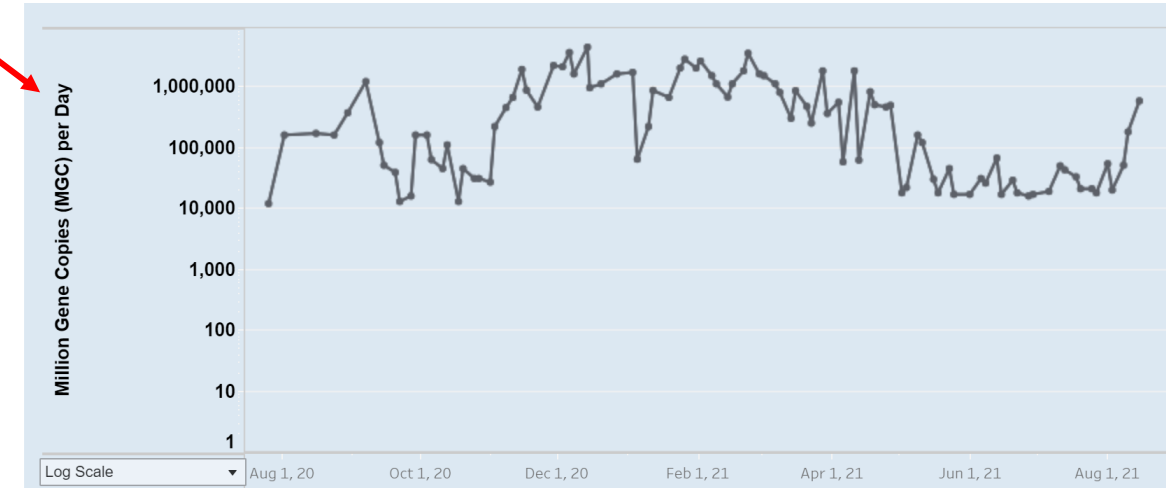
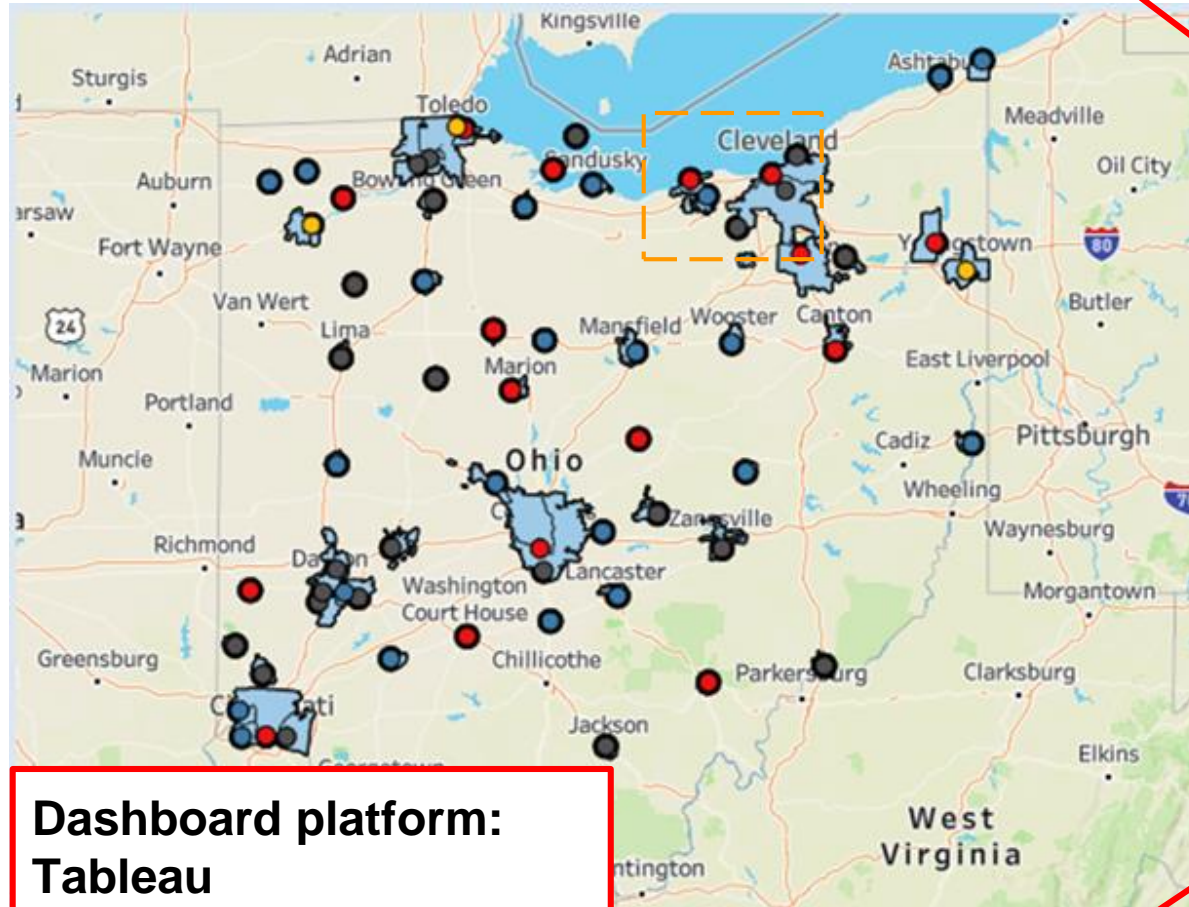
# Dashboards: HRSD, VA



\*grey catchments indicate samples below limit of detection

# Dashboards: Ohio

Load [million gene copies/day]



Dashboard platform:  
Tableau

PCR technology:  
Not standardized

concentration [copies/L wastewater]

Source: [Ohio Coronavirus Wastewater Monitoring Network](#)



# Dashboards: North Carolina

Population Normalized Viral Load [gene copies/person]

Select Date for Trend Classification:

8/11/2021

Sustained Increase



Increase



Plateau



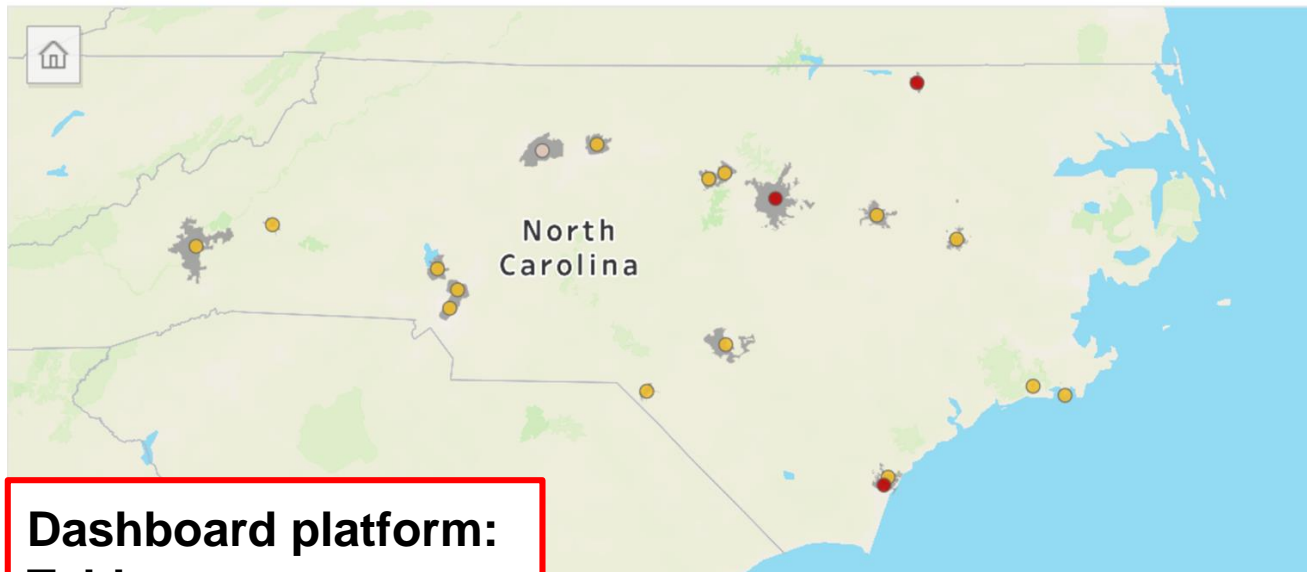
Decrease



Sustained Decrease



Unknown



Dashboard platform:  
Tableau

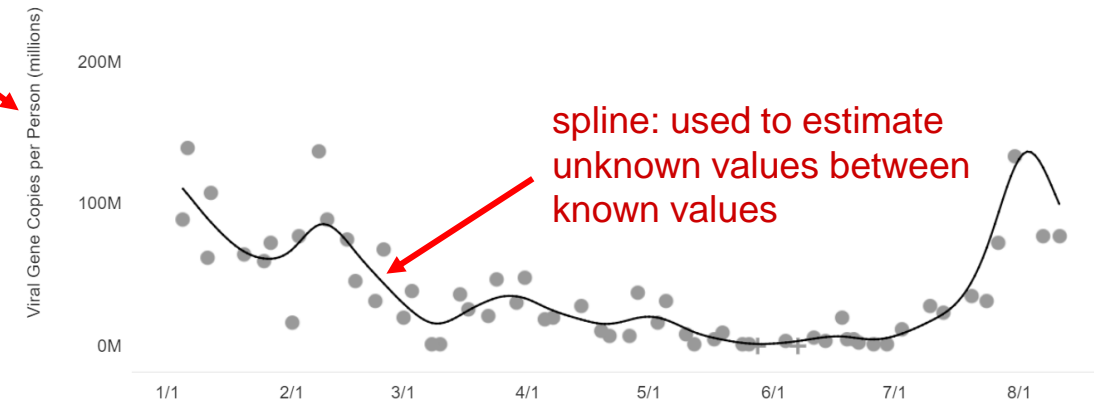
Laboratory methods:  
Not provided

## COVID-19 Wastewater Monitoring Data & Trends

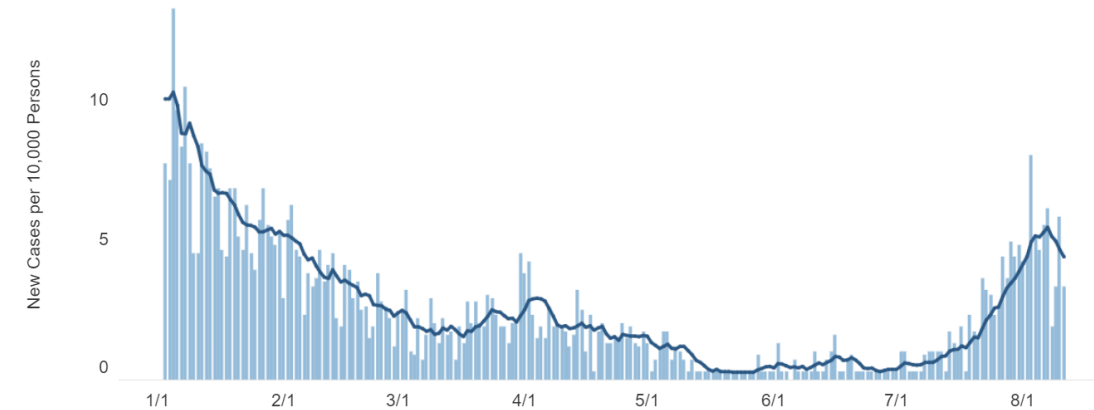
Select Wastewater Treatment Plant:

Charlotte 1

### COVID-19 Virus in Wastewater Samples ~ Charlotte 1



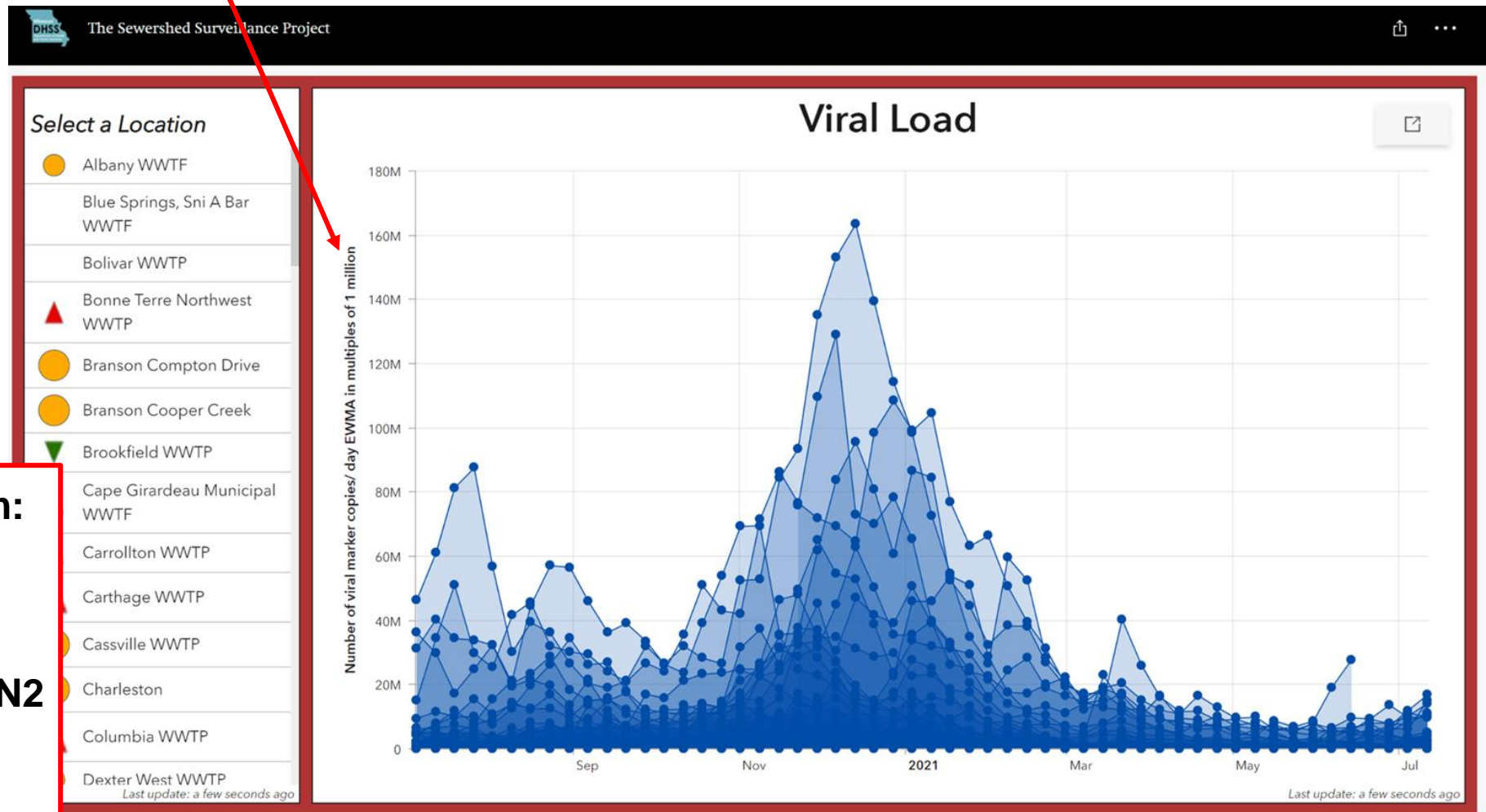
### Reported COVID-19 Cases in the Sewershed ~ Charlotte 1



Source: [North Carolina Wastewater Monitoring Network](#)

# Dashboards

Load [gene copies/person] - EWMA: exponentially weighted moving average



**Dashboard platform:**  
**ArcGIS StoryMaps**

**Gene Target(s):**  
**Average of N1 and N2**

**PCR technology:**  
**qPCR**

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**Dhaka COVID-19 tracker** | COVID-19 mapper | Latest Data | Plot by Ward and Site | About this site

This dashboard displays the reported COVID-19 cases provided by a2i and the detected SARS-CoV-2 viral load from sewage samples collected from 3 different areas of Dhaka. See the About this Site tab for more information.

**1,141 cases**  
 \*NA cases = not available yet  
 Average Viral Load: LOW  
 Week of: 18 April 2021

**Cases per Week**  
 0  
 1-49  
 50-199  
 ≥ 200  
 NA

**Sewage Viral Load**  
 0  
 Low  
 Med  
 High

**log10 SARS-CoV-2 Weekly COVID-19 Cases\***  
 Region 1 Region 2 Region 3  
 Date  
 \*Median across study wards  
 → collection start date

Select mapping date  
 01 Mar 18 Apr

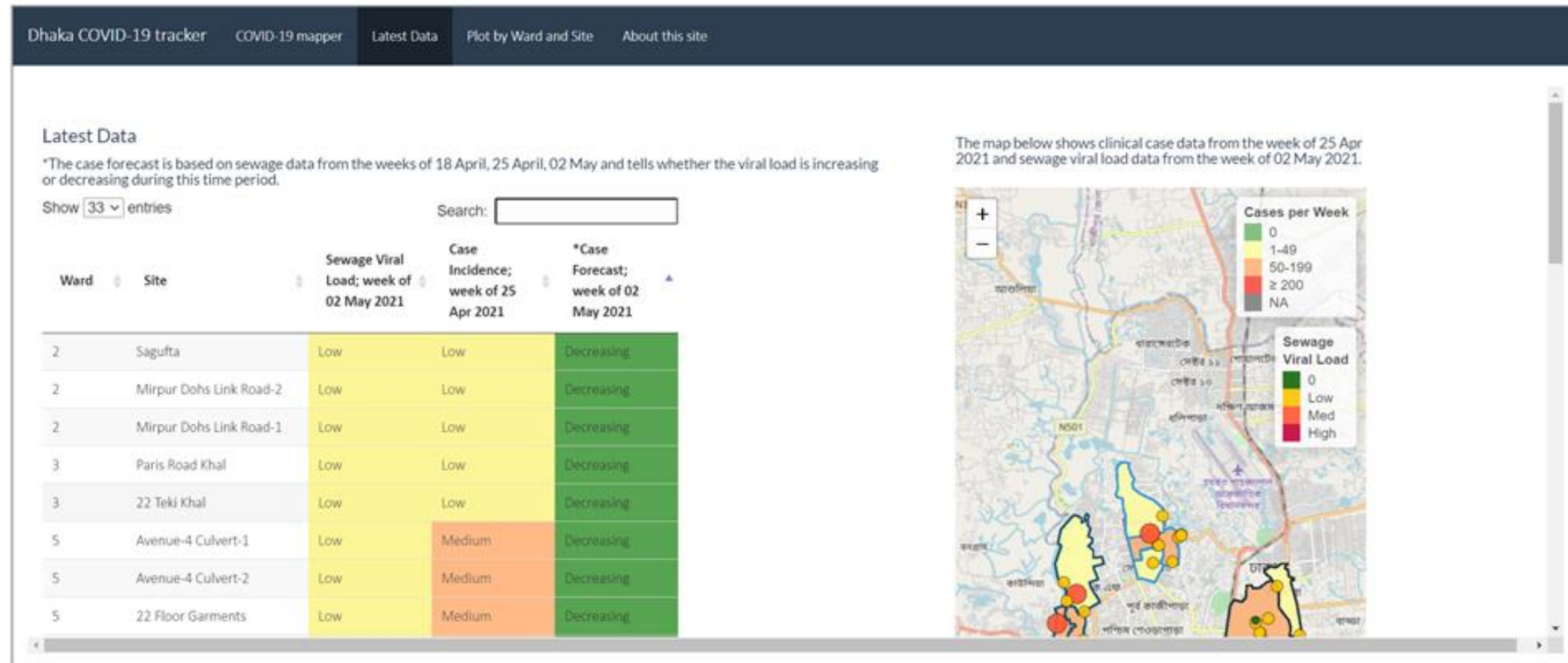
**Note:** There have been no reported cases of sewage causing COVID-19. This dashboard tracks dead virus in sewage.

☒ Clinical Case Data  
☒ Sewage Surveillance  
☒ Ward Boundaries  
☐ Watershed Catchment Areas



# Dashboards: International

## DHAKA COVID-19 TRACKER



# Key Dashboard Limitations

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## Epi Limits:

- **Suppression**
- **Anonymization**

## Interpretation Limits:

- **Variable viral concentrations (lab methods, locations, etc.)**
- **Normalization options & reporting units**
- **Provincial data**

## Clinical Interpretation Limits:

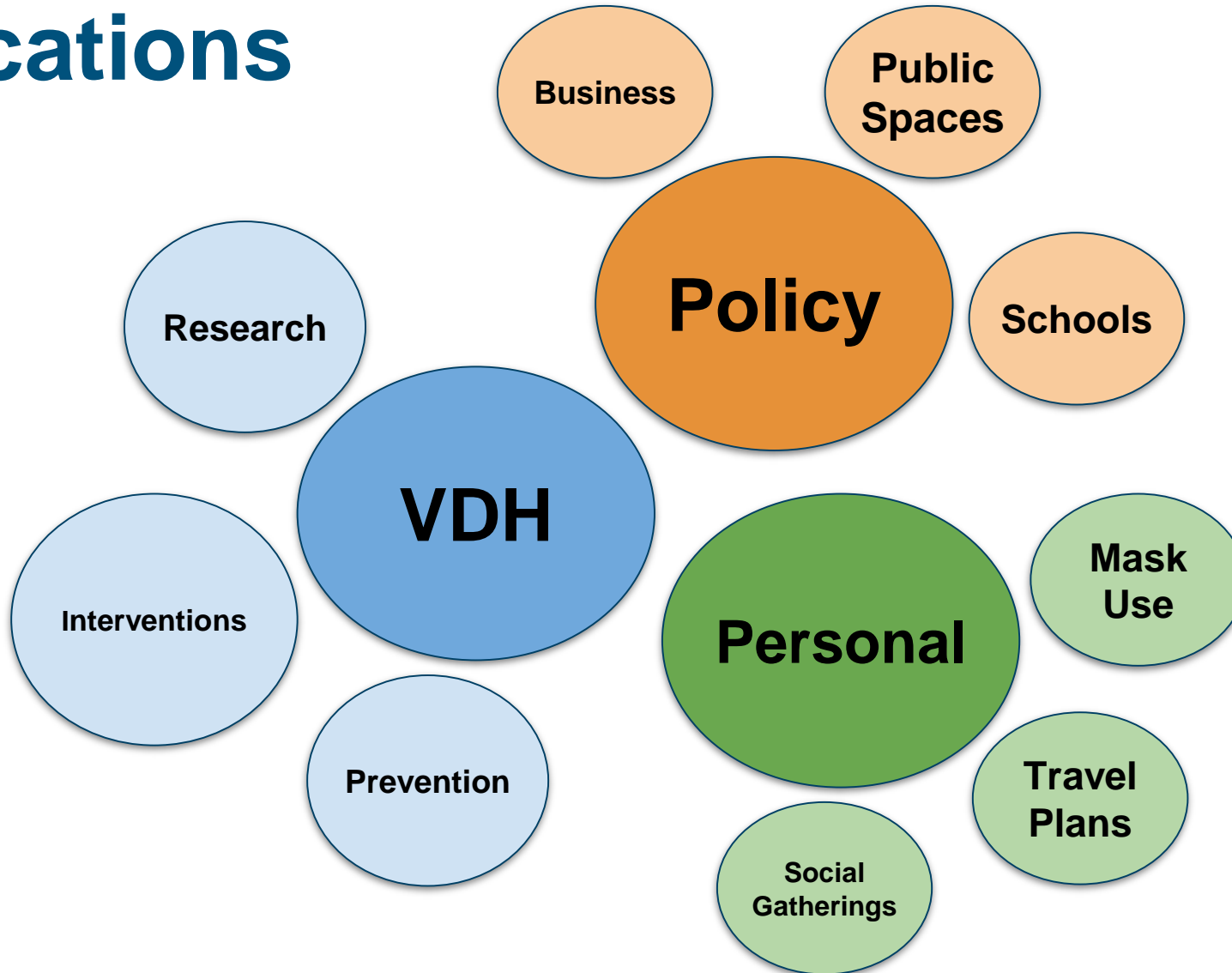
- **Mutations ARE NOT variants (detection versus sequencing)**
- **Viral loads ARE NOT clinical cases (supportive evidence only!)**

## General Limits:

- **Confidentiality**
- **Variability**
- **Complexity**

# Applications

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# Challenges

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# Questions & Open Discussion

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*Do you have a favorite dashboard that you enjoy?*

*What information would you LIKE to see on a VDH dashboard?*

*What information would you NOT like to see on a VDH dashboard?*

See you next month!

Send inquiries / topics to:  
[rekha.singh@vdh.virginia.gov](mailto:rekha.singh@vdh.virginia.gov)